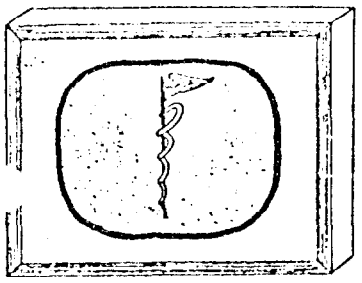

STANFORD
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CENTER

Computing Newsletter

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CONTENTS

1. Request for News

We are attempting to broaden the coverage of this newsletter to the entire Medical Center. Small machine users, Hospital ADP, medical users of the Sigma 5 at SEL, and other computer users are urged to send news items to Cindy Miller at ACME.

2. Recent Publications by ACME Users

Several ACME users have had the results of their research published in recent months. The ACME staff appreciates notification of such publications and copies of reprints when available. Some of the most recent publications we have been made aware of include the following:

A) Harman, Dr. Charles E., and Christopher S. Raymond, "Computer Prediction of Chronic Psychiatric Patients", The Journal of Nervous and Mental Disease, Vol. 150, No. 6, pp. 490-530, Copyright 1970.

B) Melges, Dr. Fredrick T., Dr. Jared R. Tinklenberg, Dr. Leo E. Hollister, and Hamp K. Gillespie, "Temporal Disintegration and Depersonalization During Marihuana Intoxication", Archives of General Psychiatry, Vol. 23, September 1970.

C) Fries, Dr. James F., "Experience Counting in Sequential Computer Diagnosis", Archives of Internal Medicine, Vol. 126, pp. 647-651, October 1970.

3. PL/ACME to IBM PL/1 Translator

A new translator from PL/ACME to IBM's PL/1 will be completed and documented by mid April. The new translator will permit programs developed on ACME to be transferred to any large IBM 360 system in the country that supports IBM's PL/1 compiler. The translator should prove to be a great aid to people transferring to other universities. It should also permit batch operation on the Campus Facility for production oriented users of programs developed under ACME. The User Note covering this topic will be BER-1.

4. Link Between ACME and Campus Facility Computers

Hardware for the link between the ACME PDP-11 and Campus Facility PDP-9 is nearly complete. It is hoped that by around the middle of April, ACME users will be able to transfer files to ORVYL on the 360/67 at Campus Facility. This will permit ACME users to run production programs in batch mode on the 360/67. In addition, Campus users will be able to transfer files from disk storage at Campus to ACME. The next ACME User Note will explain in detail how the link can be used.

5. Overnight Service

For the past two months ACME users have been given a new overnight service. The individual user places his job in the overnight queue and an ACME operator runs the job during swing or owl shift. The advantage to the user is that pageminutes are provided at a time when very few users are on the system. In general this means that fewer pageminutes are used and therefore the result in cost is less. Response to the new service has been surprisingly high. Due to the

amount of systems effort that must be accomplished during the swing and owl shifts, overnight turnaround cannot be guaranteed. To take advantage of this service use the public program OVERNIGHT.

6. ACME Grant Status

A number of users have inquired recently as to the status of the ACME Grant from NIH. The Biotechnology Resources Branch of NIH provided ACME a three year extension which will expire at the end of July, 1972. It may be possible to obtain an extension of approximately one year to the existing grant. Beyond that time a new method of supporting ACME must be found or the resource constituting ACME may have to be redefined.

7. Communications Modems

The Bell Telephone Company 103A data sets in the ACME machine room have been replaced by Prentice Electronics Company modems. This transition has occurred over the past 2 1/2 weeks. Some ACME users who enter the system via telephone lines have encountered difficulty with the new hardware. The shake down period should now be over; any further difficulty with the communications hardware should be reported promptly to the operator at extension 5903. The purpose of this change incidentally was to reduce annual operating costs.

8. ITEL 2741 Type Terminal with Paper Tape Punch and Reader

The Infectious Disease Laboratory (Dr. Petralli and Ned Russell) has recently obtained through ACME an ITEL 1051 data terminal. This terminal is compatible with the 2741 but has as an added feature the ability to punch and read paper tape. Paper tape can be punched off line from ACME and entered to the system at 15 characters per second, the normal operating speed of a 2741. Additional such units can be provided at a monthly service fee of $280. This corresponds to the current service fee of $225 charged to holders of 2741s. This fee incidentally includes services in addition to hardware rental.

9. Record Size Increase on ACME File System

On Wednesday, March 24, 1971, the maximum record size on ACME will be increased from the current 1968 characters (492 numbers) to 65535 characters or 16383 numbers. This means that you will be able to write records which are larger than block size. However reading, writing, and re-writing large records will still take a fair amount of time -- any records larger than the old restriction (block size: 1968 characters or 492 words) is a spanned record (uses multiple blocks) which will require multiple disk accesses. The ATTN key is disabled during the entire write.

The following rules still apply: 1) A single character string is not allowed to be larger than 1280 characters long (this is not true for character string arrays) and, 2) the end-of-string character must still be included in calculations to determine the length of a string or string array.

Example: Declare a(2) char(5) means that a is 12 characters long.

The following are examples of what may be written:

```
Declare  a  char(30);
Declare  b  (16383) char(3);
Declare  c  (16383);
Declare  d  (50);
Declare  e  double;
Declare  f  (500) char(10);
Declare  1  r, 2 a, 2 d, 2 e;
Declare  1  s, 2 f, 2 d;
```

The following are examples of variables too large to be written:

```
Declare  noa (70000);
Declare  nob (16500) char(3);
Declare  1 nos, 2 noone (10000),
           2 notwo (6000) char(3),
           2 nodrei (383), 2 nono double;
```

10. New Plotting Program GRAPHH

This program will plot an entire graph complete with grid, grid labels, titles and plotted data on a display or plotter, given two vectors of coordinates and the titles to be used. It is written in PL/ACME and is used as an EXTERNAL PROCEDURE. For further details, see ACME Note EG-1.

11. Problem with Statistical Subroutines

During the last month, some of the statistical subroutines would "mysteriously" stop with error message @184. This error has now been fixed.

12. CLEAN Option on Subprogram Statement

The CLEAN option on the Subprogram statement has been modified to remove the Start and End of compilation messages, as well as the line numbers, from listings. The most obvious use of the feature is that by saying --

```
SUBPROGRAM name CLEAN NOLIST;
```

a subprogram may be compiled with absolutely no compilation messages or lines of text appearing on the terminal.

13. Segment Large Programs

Users with large programs which stay in core for long periods of time (and consequently cost large amounts of money) might be advised to segment their programs in two or more smaller programs. These smaller programs could transmit data to each other through data or text files and each program in the sequence could automatically call the next program when it is needed. The CLEAN option mentioned in the previous paragraph, can be used to suppress compilation messages for the succeeding programs. An ACME consultant may be able to help you segment your programs if you need help.

14. ACME Library Function ERF(x)

One of the mathematical functions available in the ACME Function Library is

$$ERF(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-t^2} \, dt$$

In the update to the PL/ACME manual, issued in November 1970, users were asked to change the constant in this formula. This instruction was incorrect. Users are advised to restore the formula on page 2.3.5.2 of the manual to the above form.

15. Some Statistical Subroutines placed in Overlay Segment

The following statistical subroutines have been placed in overlay segment: ANOVA1, ANOVA2, AUTO, CLRATIO, CROSS, CROSTAB, EIGEN, GDATA, MULTR, ONETAB, ORDER, and TRANSPOS. This means that not all of the above subroutines are kept in core at any one time. Consequently, when a user wishes to use one of them, he might have to wait an extra time around the commutator for the subroutine he wants to be brought in from disk. Our studies have shown that the above subroutines have very low use counts. Putting them into an overlay segment was a favorable alternative to taking them out of the system since they are still available should they be desired, and the time waiting for them to be brought in off of disk should be negligible for the average user.

16. Improved Accuracy of Statistical Subroutines

ACME Subroutines ANOVA1, ANOVA2, BASTAT, ONETAB, SIMREG, and AUTO have been modified to improve the numerical accuracy of their results with regard to computing means, standard deviations, sums of squares, and sums of cross products. Previously, these subroutines gave seriously inaccurate results in certain cases. The error was worst when the mean of the data was very large compared with the standard deviation. If the ratio of the mean to the standard deviation was of the order 16^k, then 2k significant digits might be lost. (Sixteen because ACME's 360 is a hexidecimal machine.) If the data was at least roughly normally distributed, then about 95% of the observations should fall within two standard deviations of the mean, and a visual check of the data would indicate whether a serious loss of accuracy had occurred.

User Note J-30 dated December 1, 1970, explained similar changes for the ACME Subroutine BASIC, but there was an error. The article in J-30 said, "If the ratio of the mean to the standard deviation was of the order 16k," but it should have said, "If the ratio of the mean to the standard deviation was of the order 16^k," as in the paragraph immediately preceeding.

The accuracy of ANOVA1, ANOVA2, BASTAT, ONETAB, SIMREG, and AUTO has now been significantly improved. For a detailed description of the changes made in these subroutines see their respective ACME Notes: EAT-6 for ANOVA1, EAU-6 for ANOVA2, EAG-4 for BASTAT, EAC-5 for ONETAB, EAL-6 for SIMREG, and EAR-4 for AUTO. If you have any questions please contact Jane Whitner, extension 6120 or Bob Hale at extension 6126.

17. Faster Program Compilation and Execution

After you have tested and debugged your program use "PROGRAM CRUNCH PUBLIC" to crunch it into a newfile. To easily achieve the maximum line length of 200 characters, respond to line length prompt with the word STANDARD. See ACME Note EDR. If there are any questions, please contact Bob Bassett at extension 6120.

18. New and Updated ACME Notes Since Last Newsletter

New

FSEC-1	File Security (G. Wiederhold), February 25, 1971
HPDP11-1	PDP-11 to 360 Connection (Van der Lans/Osborne), February 23, 1971
EG-1	ACME Subprogram GRAPHH: Creates Display and Plotter Output (Hale), March 22, 1971

Updated

CT-13	ACME Terminal Listing (Class), March 10, 1971
EAR-4	ACME Subroutine AUTO (Shih/Whitner), February 10, 1971
EAT-6	ACME Subroutine ANOVA1 (Liere/Whitner), March 17, 1971
EAU-6	ACME Subroutine ANOVA2 (Liere/Whitner), March 12, 1971
EBG-3	ACME Program Library JACKNIFE: Confidence Limits for a Ratio of Two Means (Moore/Whitner), February 11, 1971
EFE-2	ACME Program Library LISTAKER: Listing/Punching Service (Bassett), February 1, 1971
KL-3	Tables in ACME Dependent on System Parameters (Wiederhold/Girardi), February 23, 1971
OL-7	Loading ACME, ACME29, and ACMEØ2 Systems (Class, Granieri, Sutter), February 19, 1971
WPDA-2	2701 PDA: External Devices Connection (Girardi/Class), February 17, 1971